Title: 3-Nitrolbenzanthrone, A Powerful Bacterial Mutagen and Suspected Carcinogen Found in Diesel Exhaust and Airborne Particulates

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Summary:

3-Nitrolbenzanthrone (3-nitro-7 H-benz(d,e) anthracen-7 one) was identified as a new class of powerful direct mutagen. Its mutagenicity by Ames Salmonella assay is very high (208,000 revertants/nmol in Salmonella typhimurium TA98 and 6,290,000 revertants; nmol in YG1024) and compares with that of 1,8-dinitropyrene, which is the direct mutagen of strongest activity (257,000 recertants/nmol in TA98 and 4,780,000 revertants/nmol in YG1024) so far reported in the literature. The new mutagen was also shown to induce micronuclei in mouse peripheral blood reticulocytes after intraperitoneal administration (micronucleated reticulocytes, 0.6% against 25 mg/kg dose after 48 h), suggesting its potential genotoxicity to mammalians. 3-Nitrobenzanthrone is most likely to be formed not only during the combustion process of fossil fuels but also from the atmospheric reaction between benzanthrone and lower oxides of nitrogen, since the latter ketone was found to be nitrated quite easily under an artificial atmosphere containing gaseous NO2 (10 ppm) and 03 (5 ppm) to produce the powerfully mutagenic 3-nitro derivative as the major product, along with several other isomeric mononitrobenzanthrones and dinitro descendants as minor products.

Market Segment: General Interest

Accesibility: Public

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